at1121exam_practice EXAMPLE! DO NOT HAND IN FOR CREDIT (v16)

- If you are looking for a practice exam that you can hand in for credit:

https://chadworley.github.io/algtwo2026/u04/1121/at1121exam/at1121exam.html

Question 1

Simplify the radical expressions.

$\sqrt{20}$ $\sqrt{98}$ $\sqrt{28}$

$\sqrt{2 \cdot 2 \cdot 5}$ $\sqrt{7 \cdot 7 \cdot 2}$ $\sqrt{2 \cdot 2 \cdot 7}$

$2\sqrt{5}$ $7\sqrt{2}$ $2\sqrt{7}$

Question 2

Find all solutions to the equation below:

$$2\left((x+8)^2 - 10\right) = 52$$

First, divide both sides by 2.

$$(x+8)^2 - 10 = 26$$

Then, add 10 to both sides.

$$(x+8)^2 = 36$$

Undo the squaring. Remember the plus-minus symbol.

$$x + 8 = \pm 6$$

Subtract 8 from both sides.

$$x = -8 \pm 6$$

So the two solutions are $x = -2$ and $x = -14$.

Question 3

By completing the square, find both solutions to the given equation. *You must show work for full credit!*

$$x^2 - 18x = 88$$

Take the linear coefficient, -18, halve it and square the result. You should get 81. Add this to both sides of the equation to complete the square.

$$x^2 - 18x + 81 = 88 + 81$$

$$x^2 - 18x + 81 = 169$$

Factor the perfect-square trinomial.

$$(x - 9)^2 = 169$$

$$x - 9 = \pm 13$$

$$x = 9 \pm 13$$

$$x = 22 \quad \text{or} \quad x = -4$$

Question 4

A quadratic polynomial function is shown below in standard form.

$$y = 2x^2 + 12x + 27$$

Express the function in **vertex form** and identify the **location** of the vertex.

From the first two terms, factor out 2 .

$$y = 2(x^2 + 6x) + 27$$

We want a perfect square. Halve 6 and square the result to get 9 . Add and subtract that value inside the parentheses.

$$y = 2(x^2 + 6x + 9 - 9) + 27$$

Factor the perfect-square trinomial.

$$y = 2((x + 3)^2 - 9) + 27$$

Distribute the 2.

$$y = 2(x + 3)^2 - 18 + 27$$

Combine the constants to get **vertex form**:

$$y = 2(x + 3)^2 + 9$$

The vertex is at point $(-3, 9)$.